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ABSTRACT

In 1997, 558 Compaq Armada 1510 notebook computers and Canon color bubble-jet printers were distributed to incoming freshman at Grove City College (Pennsylvania) as a part its Information Technology Initiative (ITI). Objectives of the ITI were: (1) to prepare students for excellence in their chosen profession by providing the necessary technological tools and instruction; (2) to recognize, in a tangible manner, the fact that state-of-the-art computing is moving away from centralized computing and rapidly toward distributed computing facilities following the concept of anytime/anywhere learning; (3) to increase the technological resources available to students on campus while reducing the total cost of technology ownership to the college; and (4) to centralize all support activities, including the computer help desk, training and repair shop staff. This paper reviews the ITI plan, including reasons for choosing laptops, benefits of the one-computer-per-student model, and the campus computer help desk and repair shop. The evolution of ITI hardware and software from 1994 to the present is outlined. Other highlights include formation of a Campus Technology Task Force, expansion of the campus network, increases in staffing, and growth in use of Internet and intranet services for class-related activities. (AEF)

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The Information Technology Initiative at Grove City College: Four Years Later

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Introduction

On August 30, 1997, five hundred fifty-eight Compaq Armada 1510 notebook computers and Canon color bubble-jet printers were distributed to incoming freshmen, members of the class of 2001. With that event Grove City College (GCC) had reached an important objective: the Information Technology Initiative at GCC fully involved all 2200 students.

Progress of the GCC Information Technology Initiative (ITI) was presented at the 1994 and 1995 ASCUE Conferences prior to and after the first year of the Initiative. This report summarizes a perspective of the Initiative after four years.

Review of the plan

The objectives of the Initiative are as follows:

1. To prepare students for excellence in their chosen profession by providing the necessary technological tools and instruction

2. To recognize, in a tangible manner, the fact that state-of-the-art computing is moving away from centralized computing and rapidly toward distributed computing facilities following the concept of Anytime/Anywhere Learning.

3. To increase the technological resources available to students on campus while reducing the total cost of technology ownership to the College

4. to centralize all support activities including the computer help desk, training and repair shop staff.[1]

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Laptops were chosen for a number of reasons. Students need computers in a variety of environments: science labs, dorm rooms, study rooms, the classroom, and a faculty advisor's office. Providing desktop computing labs able to meet these kinds of needs is difficult and costly in terms of hardware and software upgrades, support and maintenance. Lack of campus-wide standards in desktop systems compounds the problems. Portable systems alleviate many of these concerns, or at least lessen the difficulty in addressing them.

The College implemented a one-computer-per-student model, creating an Anytime/Anywhere Learning[2] environment. Systems have been distributed to students and faculty. Motivation for this strategy includes the following benefits:

1. Laptop computers can easily be transported to a classroom or laboratory to be used in place of a traditional desktop computer.
2. Laptop computers are the only true mechanism that can be used to create an Anytime/Anywhere Learning environment.
3. Students have the convenient and continual access to technology. In fact, students are allowed to take the computer system home with then during breaks.
4. New technology is introduced each year through the purchase of equipment for freshmen students.
5. The number of computer labs on campus has been greatly reduced.
6. Students and faculty are required to bring defective equipment to a central repair shop, thus eliminating the need for technicians to travel to an office or dorm room.[3]

The infrastructure necessary to support this endeavor features the Computer Help Desk and the Computer Repair Shop. The Help Desk (housed in the Technological Learning Center) is open from 8:00 am until midnight on weekdays and staffed by shifts of 35 students. The Help Desk has reduced hours on weekends, as do the library and computer center. A full-time manager oversees the operation of the Help Desk, and is responsible for the scheduling and training of student workers. Workers are trained in the hardware, software (*MS Windows, Works, Mathematica*), and networking systems. The Repair Shop is staffed by a full-time secretary and a full-time repair technician who is Compaq Self-Maintainer certified.

The laptop computer initiative has been well received and has been the focus of much attention both on and off campus. The entire GCC community has positively embraced the initiative and the benefits are worth the expended energy and cost of the necessary work and planning.

Update of the Computer Initiative Systems

Since the last report of this initiative, significant changes have occurred on campus. The following table summarizes the evolution of the hardware over the past four years, and includes a tentative configuration for the system for freshmen arriving in the fall. Please note the dramatic change in computer power represented by the various systems over the five years.

1998-1999??	1997-1998	1996-1997	1995-1996	1994-1995
200 MHz processor	120 MHz processor	100 MHz processor	50 MHz processor	25 MHz processor
Dual-scan color screen	16 MB RAM	8 MB RAM	8 MB RAM	4 MB RAM
32 MB RAM	1.0 GB hard drive	800 MB hard drive	350 MB hard drive	120 MB hard drive
2.0 GB hard drive	33.6 baud modem	33.6 baud modem	PCMCIA slots	1200 baud modem
33.6 baud modem	10base-T network card	Canon BJ-240L color	19.2 baud modem	HP 500 Inkjet or Canon
10/100 PCMCIA	10x internal CD-ROM	bubble-jet printer	Canon BJ-240L color	BJ-240L color bubble-
Ethernet card	Multi-media	*MS Windows 95*	bubble-jet printer	jet printer
20x internal CD-ROM	Canon BJ-240L color	*MS Works 4.0*	*MS Windows 95*	*MS Windows 3.1*
w/ multi-media	bubble-jet printer		*MS Works 4.0*	*MS Works 3.0*
Canon BJ-240L color	*MS Windows 95*			
bubble-jet printer	*MS Works 4.0*			
MS Windows 95				
MS Office Pro 97				

Some students are disappointed to keep the same computer during their four-year tenure at the College. To address some of these concerns, students have been able to add memory, upgrade hard drives, or add external peripherals. However, the College does not participate in a computer refresher program; students cannot upgrade to a newer computer model. The added cost of a computer refresher program (and the low residual value of the older machines) would have an undesired effect on GCC's tuition, now approximately $11,000 annually for tuition, room and board, and computer.

As one might guess, faculty members tend to be more vocal in expressing their dissatisfaction with the limited processing power of the first year 25MHz systems that they were distributed. While the College has been unable to replace all faculty systems on a whole scale basis, normal budgeting processes have enabled some departments to upgrade laptop systems sooner than others. Forty-six of the 50 MHz systems with memory upgrades have been distributed to faculty, most of them going to faculty in the humanities. Other faculty systems have been upgraded with larger hard drives, additional memory, and external CD-ROM drives. With respect to software, most faculty have migrated to *Windows 95* and *Microsoft Office*. This may present compatibility difficulties with student files created in *MS Works*.

Facilities

At the request of the President of the College, a Campus Technology Task Force was formed in the Fall of 1996. The charge of this committee was to contribute to the plan to continue the momentum of the Information Technology Initiative, and to "critically review the effectiveness of the program to date and develop mechanisms to rectify the shortcomings of the initial effort."[4] Many of the changes and proposed changes in the facilities that related to the ITI are a result of the recommendations of the committee report.

The campus network has expanded significantly since the last report to ASCUE. At that time, access to the network resources was available only by dialup for the majority of faculty and students. The campus backbone to the dormitories has now been completed. The infrastructure is Full-Duplex Asynchronous Transfer Mode (ATM) @ 155 megabaud, yielding 310 megabaud capacity per building connection. The network is switched on-campus and routed to the Internet. ATM uplinks feed Fast Ethernet (100 Mbps) which feed Ethernet (10 Mbps) switches.

All faculty offices have been provided with 10base-T network connections except for the Physical Learning Center. The science building, engineering building, and computer center are fully connected, as are administrative offices. Plans for the main classroom building continue, with the goal of being connected in classrooms by fall. Three relatively large lecture halls are currently capable of supporting multimedia lectures and demonstrations.

The freshman (510) were provided with network adapters as part of the ITI. Upperclassmen were given the option of purchasing network adapters and 256 have thus far. The total represents 38% of the resident population (2025). Few seniors elected to purchases parallel port network adapters. Training sessions are required before the network adapters are distributed and the systems are properly configured.

The main public access lab in the computer center has decreased in the number of supported stations and platforms over the last several years, but the lab has not disappeared. The College still has a Novell Intranetware LAN of desktops offering software not licensed broadly (*PageMaker, FrontPage, Office*, and discipline specific applications.) A significant number of upperclassmen choose to use the public access lab for Internet access for email and the Web, even though they may elect to connect to the campus network from the dorm if they have purchased an adapter. "Walk-up" stations have been installed in the computer center allowing commuting students to connect to the network at any of the stations.

Staffing

The staff to support the ITI has grown. Personnel include two network specialists, two repair specialists, secretary, ITI director, and recently added was a software specialist/trainer. The software specialist/trainer manages the Help Desk and has delivered a significant amount of training to faculty and administrative users. STARS (Student Technology AdvisoRS), based upon the model developed at Wake Forest University, is currently under development. This program provides procedures for faculty to utilize student help for technology-related projects.

Repair Shop

As mentioned previously, the Repair Shop has two full-time repair technicians who are Compaq certified. They are also certified to repair Canon printers, and will shortly be certified for Hewlett-Packard printers as well.

Except for the two-week period after the start of each semester, the shop has been able to maintain a 24-hour turn-around repair rate. During the busy start of each semester, the turn-around time averages three days.

Curriculum

The use of Internet and intranet services for class-related activities has grown on campus as the number of campus constituents on the network has increased. The integration of technology into courses various from department to department, from professor to professor. The College has been supportive of faculty wishing to increase their knowledge and comfort level of technology

integration. Many challenges still lie ahead in this area. In addition to increasing the amount and availability of training, the Campus Technology Task Force has also recommended the hiring of an instructional technologist to support faculty.

Within the service courses in the Computer Systems Department(Introduction to Microcomputers and Applications, Technologies of Instruction, for example), the annual upgrade of freshmen machines has created an interesting logistical problem. These courses introduce *MS Windows* and *MS Works* as units of study; the senior class has *Windows 3.1* and *Works 3.0*; underclassmen have *Windows 95* and *Works 4.0*. Teaching hands-on lessons with students with different versions of system and application software has been challenging. This problem will surface again as the College migrates to *Office 97* for students.

The notebook computers, however, have been particularly beneficial within other Computer Systems Department courses, particularly course involving programming. Students are able to bring their notebook computers (and compilers) to class and write, test, or debug code segments illustrating new concepts. Students are able to bring their systems to faculty offices, working through a problem in the debugger on the student system. Students of other courses such as Systems Analysis or MIS are able to use their own systems for presentations with PowerPoint. The benefit of Anytime/Anywhere Learning is in full force.

Summary

The Information Technology Initiative has required a tremendous commitment of resources in terms of time, planning, personnel, and work, but the benefits for the College community have also been tremendous. The Anytime/Anywhere Learning strategy prepares GCC students for lifelong learning in the information age.

[1]Inman, John G. Available on-line: http://www.microsoft.com/education/hed/news/January/itofage.htm.
[2]Available on-line: www.microsoft.com/education/k12/aal/.
[3]Inman, John G. Available on-line: http://www.microsoft.com/education/hed/news/January/itofage.htm.
[4]Goncz, Joseph G. Report and Recommendations, Grove City College Campus Technology Task Force, March 1997.